

What is claimed is:

1. A three-dimensional data generating system comprising:

a measurement portion for generating three-dimensional data by measuring a three-dimensional shape of an object;

a position and posture changing portion for changing a position or a posture of the object;

a position and posture sensing portion including a first element provided in the measurement portion and a second element provided in the position and posture changing portion, wherein the position and posture sensing portion measures a relative position and a relative posture between the first element and the second element; and

a data integrating portion for integrating plural sets of three-dimensional data generated by plural times of measurements in the measurement portion based on each of the relative positions and the relative postures measured by the position and posture sensing portion at each of the measurements.

2. The three-dimensional data generating system according to claim 1, wherein

the position and posture changing portion includes a movable member whose position and posture are kept constant with respect to the object during the plural times of measurements; and

the second element is provided in the movable member.

3. The three-dimensional data generating system according to claim 2, wherein

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the position and posture changing portion further includes a support board for changing the position and the posture of the movable member; and

the movable member is a turn table rotationally driven by the support board.

4. The three-dimensional data generating system according to claim 1, wherein

the position and posture changing portion includes:

the movable member whose position and posture are kept constant with respect to the object during the plural times of measurements,

a base member for changing the position and the posture of the movable member, and

a detecting portion for detecting an amount of change of the position and the posture of the movable member with respect to the base member; and

the second element is provided in the base member.

5. The three-dimensional data generating system according to claim 4, wherein

the base member is the support board and the movable member is the turn table rotationally driven by the support board; and

the detecting portion includes an encoder for encoding a rotational angle of the turn table to the support board.

6. The three-dimensional data generating system according to claim 1, wherein

the first element measures the position and the posture of the second element with respect to the first element.

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7. The three-dimensional data generating system according to claim 1, wherein

the second element measures the position and the posture of the first element with respect to the second element.

8. The three-dimensional data generating system according to claim 1, wherein

the plural second elements are provided in the position and posture changing portion.

9. The three-dimensional data generating system according to claim 1, wherein

the position and posture sensing portion measures the relative position and the relative posture between the first element and the second element by electromagnetic induction.

10. A three-dimensional data generating system comprising:

a measurement portion for generating three-dimensional data by measuring a three-dimensional shape of an object without contacting the object;

a sensor for measuring a relative position and a relative posture between either one of a first member and a second member and the measurement portion, the first member whose position and posture being kept constant with respect to the object during plural times of measurements by the measurement portion and the second member being capable of detecting a relative position or a relative posture with respect to the first member; and

a data integrating portion for integrating plural sets of three-dimensional data generated by the plural

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times of measurements based on each of the relative positions and the relative postures measured by the sensor at each of the measurements.

11. The three-dimensional data generating system according to claim 10, wherein

the measurement portion includes a three-dimensional measurement device for generating the three-dimensional data of the object by a light section method.

12. The three-dimensional data generating system according to claim 11, wherein

the three-dimensional measurement device is movable to an arbitrary position and an arbitrary posture during the plural times of measurements.

13. The three-dimensional data generating system according to claim 10, wherein the measurement portion includes:

a digital camera for photographing a two-dimensional image of the object; and

a three-dimensional data generating portion for generating the three-dimensional data of the object based on the plural two-dimensional images of the object photographed by the digital camera.

14. The three-dimensional data generating system according to claim 13, wherein

the digital camera is movable to an arbitrary position and an arbitrary posture during the plural times of measurements.

15. A three-dimensional data generating system comprising:

a measurement device for generating three-

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dimensional data by measuring a three-dimensional shape of an object from an arbitrary position at an arbitrary posture;

a sensor for measuring a position and a posture of the measurement device at each of the measurements; and

a data integrating portion for integrating the three-dimensional data of the object generated by the plural times of measurements at different positions and postures.

16. The three-dimensional data generating system according to claim 15, wherein

the sensor includes a transmitter and receivers and measures the position and the posture of the measurement device with respect to the object based on a relative position and a relative posture between the transmitter and each of the receivers.

17. The three-dimensional data generating system according to claim 16, wherein

the receivers are provided at an object side and a measurement device side and the transmitter is provided away from the object as well as the measurement device.

18. A method for generating a set of three-dimensional data by integrating plural sets of three-dimensional data, the method comprising the steps of:

generating the plural sets of three-dimensional data by plural times of measurements of an object at different positions or postures using a measurement device;

calculating a three-dimensional coordinate and an Eulerian angle of one of the measurement device and the object with respect to another one of the measurement

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device and the object by measuring a relative position and a relative posture between the measurement device and the object at each of the measurements; and

generating a set of three-dimensional data by integrating the plural sets of three-dimensional data using the three-dimensional coordinate and the Eulerian angle that have been calculated.

19. The method according to claim 18, wherein frames including the generated three-dimensional data are generated and memorized in accordance with generation of the three-dimensional data; and

the three-dimensional coordinate and the Eulerian angle calculated at each of the measurements are memorized as a part of each of the frames.

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